FOOD PREPAREDNESS FOR THE UNITED STATES

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BY

CHARLES O'BRIEN

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TO

HORACE FLETCHER

PIONEER AMERICAN FOOD ECONOMIST
WHOSE THEORIES REGARDING NUTRITION HAVE
BEEN VINDICATED IN THE WAR

FOREWORD

In September, 1916, the author went to Germany to study economic conditions there in war time, particularly those regarding food supply. In the latter part of November, while there, he learned of the intention of the German government to institute its program of unrestricted submarine warfare against all shipping touching at English ports. The plan then was to start such warfare January 1, 1917, but it was delayed till February 1 by the peace proposals of December, and particularly by President Wilson's attempt to open peace negotiations. It was my belief at the time that the Germans did not expect their own peace proposals to be accepted, that they were simply a gesture of peace calculated to create dissension in Allied camps, to square Germany's

record historically and with neutrals as being for peace, and for home consumption. I believed then that, if they had thought their proposals would be accepted, they would never have made them. They were flushed with their Roumanian victories at the time, and the war party at least was counting on winning the war, of bringing England to her knees by a starvation campaign, which, it was figured, would be successful in a few months. That campaign would have been begun earlier if they had been ready for it. The Chancellor's opposition, whether real or feigned, was finally overcome, the decision being made by the Kaiser, the final arbiter in all such matters in Germany. I heard that the question was raised as early as the Spring of 1916 at the time of the final answer to the Lusitania notes, and that the decision then was adverse because the submarine building program was not sufficiently advanced.

Sensing the danger of the situation as

it affected us, I determined that on my return to the United States I would do what I could towards awakening our country to the situation, so much misrepresented and so little understood here. Accordingly, following my arrival Christmas day, I began an agitation of the question of food preparedness for the United States, based on what I had learned abroad. Since then we have entered the war and the facts have become known generally as to the full meaning of the submarine campaign, and we have already started on our way towards a control of the food supply situation.

This book is designed to point out to the individual some of the factors involved and the lessons to be learned from the experiences of the European belligerents, particularly Germany, where food control has been most necessitous and most highly developed. It is not an attempt, therefore, to review the German food situation or discuss its relative pleasantness or un-

pleasantness — it is unpleasant enough, and much has been written of it from that angle, with varying conclusions. No man knows whether Germany will or will not be starved out. That may depend entirely on the weather and good or bad crops resulting therefrom; and even bad weather and bad crops, unless prolonged, might not be conclusive, if, like Joseph in Egypt, Germany has, as some believe, created reserve stores, unknown even to her own people, doling them out only as found necessary. The only safe assumption for us as her enemy is that she has sufficient men, munitions and food to hold out, as she claims she has, and for us to try to overwhelm her by superior force and superior brains.

It has seemed to me significant that in rationing her people according to her available supplies, she has done so on a basis that was outlined by scientific nutrition experts, who figured the minimum of food required to sustain the body in

health, strength and endurance, however iron-like the ration might be. It was a new departure in warfare and justifies a study of her situation and her ability to hold out as viewed from that standpoint. It is not an experiment in dietetics conducted under ideal laboratory conditions, but one on a national scale, limited by the exigencies of available supplies. We shall learn more of the results when the war is over.

In addition to the direct acknowledgments contained in the text of the book, I wish also to acknowledge indebtedness to Mr. George Wharton of the United States Department of Agriculture, Miss Edith Cockins of the Ohio State University, and Mr. Edward Lyell Fox, war correspondent. To many others, including government officials, I am indebted for their interest and encouragement.

CHARLES O'BRIEN

May, 1917

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FOOD PREPAREDNESS FOR THE UNITED STATES

CHAPTER I

Democracy Versus Autocracy

We have gone to war with the mightiest military and economic machine that the world has ever known. We are pledged to fight until that machine is broken. Our President has pledged us to wage war until the world is made safe for democracy, until the Prussian autocracy is eliminated and the German people freed from its domination. These ends will not be accomplished if we believe that the German war machine is already crumbling, that peace is not far off. Such beliefs are fatuous and will not topple down the Imperial German structure.

We must face the facts. We must not approach this war in the belief that the Allies have stretched the German giant on his back and that now it is quite safe for us to come alongside and jump on him. Let us heed rather the words of Jellicoe, First Sea Lord of the British Empire, who on April 16, 1917, advised America that the submarine menace had yet to be met. Let us believe Lord Beresford when he says that submarines are building faster than sinking and that the long twilight hours of summer will multiply their menace. Believe Winston Spencer Churchill when he says that the most terrible and fateful months of the war face his country. Let us believe Ambassador Gerard, who says: "There is another danger now and that is the delusion that the war is going to be soon over. . . . It is going to be a long war. The Germans are not going to be beaten because they need food. They are not going to be beaten by internal revolution.

They are not the kind of people to indulge in revolution." It means that there is danger when Woodrow Wilson, a man of peace, throws down the gauntlet of war and forces conscription through Congress; when we plan to spend a billion dollars, if necessary, to build ships in which to rush food to Europe.

Food! Food! Food! On it hinges success or failure. On the one hand the Allies are trying to starve out Germany, and on the other Germany is trying to starve out the Allies. It is a question of a race between the German building and manning of submarines and our construction of merchant ships and production of food. The stomachs of whole peoples are to be pinched until there is a cry for peace. Great Britain calls to us: "Never mind the men; send us food." American wheat fields and grazing lands for the moment are more important than military training camps.

It was the elder Moltke who said that

the only defense is an attack, and for the Prussian military machine those words are truth. German strategy, put on the defensive, a food *defensive,* by the blockade of the Allies, is defending itself by a food *offensive.* By her submarines she plans to starve her enemies into submission, breaking the military deadlock on land by a victory at sea, her weapon being the torpedo sent against food cargoes.

The day we entered the war we were unprepared to assume its tremendous burden, and Germany has calculated that before we can become effective against her she will have won. Our immediate problem is one of food, not only for ourselves but the Allies. On that issue alone the war may be decided. It may end through lack of food before we can become of weight in a military way.

When the war began the highly individualistic states of England and France had to meet the highly socialized state of Germany. Under war's pressure they

have become highly efficient and socialized units, rivaling in their new organization the organization of Prussia itself. Can we learn in a few months what they have learned in years of warfare, benefit from their experiences, sink our differences and our individualisms, centralize and coördinate our efforts and our forces into a national unit, avoid "muddling" and make of ourselves a deciding factor in the war?

A weak and inadequate policy on our part will but play into the hands of Imperial Germany. Her autocracy has no respect for any but strong measures. It will not be safe for us to assume that that autocracy is losing its grip on the German people. Excepting the more radical socialists, they are devoted to their leaders and trust them. They blame their enemies for their hardships. They do not blame their own government. The snowball of revolution may start rolling in Germany, as it did in Russia, but it

would be the height of folly for us to count on it.

It will be safer for us to assume that the German government is strong in its position, that it may be rendered still stronger by happenings in Russia, that it may yet have accessions of power to its side, that possibly its submarine campaign may succeed, and that, having entered the war and thrown down the gauntlet to the Prussian autocracy, we may yet have to stand the brunt of the war, even seeing it transferred to this side of the Atlantic. We are fighting a powerful enemy and one that does not wage toy warfare. We have made the issue the survival of democracy or autocracy. We should expect to see that issue accepted.

We must win. We must put into the war all our resources in men, money, munitions, ships and food. If we do, it is possible that we may stagger the German imagination and cause her soldiers to lose heart, but that would be a foolish

thing for us to count on. America, as the land of freedom, looms large in the imagination of the common man in Germany, larger than we realize over here, but America as a military factor in this war will be estimated by the Germans for what she is worth and no more. Germany would fear us more if we were thoroughly armed and prepared. She hopes to win before our weight can be thrown against her.

The immediate necessity being food, we find ourselves on entering the war faced with a shortage and operating under prices that have mounted to unheard-of heights. George E. Ferrill of the United States Department of Agriculture says that, if things continue as they are, there will not be enough food in the United States the coming winter to feed ourselves, let alone the Allies.

We are short of food because we have been sending it abroad. We are going to send still more. A large part of it will

be lost. It will be sent to the bottom of the ocean by submarine torpedoes. We shall have to export more food than is actually needed to meet requirements. We must export a large surplus to cover the wastage caused by the submarines. We must grow crops such as we have never grown before. By intensive cultivation of small farms and backyard gardens we must provide a large portion of our own requirements. We must leave our big staple crops, so far as possible, for export. We must eliminate waste. We should go on rations to enforce economy on the heedless. In the main we should consume such things as green vegetables and potatoes, which are too bulky or perishable for ocean shipment, and send our less bulky wheat, corn and meat abroad.

To do all this we need a food controller with power as absolute in food matters as that of the commander-in-chief of our army and navy.

CHAPTER II

Food Preparedness Versus Unpreparedness

For the germination of the idea of food preparedness, as developed in this war, we must go back one hundred and fifty years to the time of Frederick the Great. He was the father of Germany's passion for organization, system and efficiency. He was a farmer as well as a military genius. He not only gave the peasants seed, but supplied them with animals and farm implements. He established a model turnip farm on his estate at Sans Souci. Potatoes were then a new crop in Europe. He ordered his people to plant them. He personally inspected the crops in the field. Those who grew good crops he rewarded. Those who neglected their opportunities he horsewhipped. His

methods were as crude as the century in which he lived, but they brought results.

Before this war the idea of food preparedness was still in embryo. Germany alone had done anything with it, and she had not worked it out, but she had made a start. She had mobilized the information of the world on the subjects of scientific agriculture and nutrition and filed the information for future reference. She did not tell the world that she had done so. She did not know more on those subjects than men in other countries (our own included) know, but what she knew she knew as a nation.

When the war came she was ready to apply her knowledge, and although she has made many mistakes in its application, yet it was the foundation of that knowledge that has enabled her to cope with her situation and hold out within her "iron ring" against a world of enemies. Without that preparation she would have collapsed long ago.

Her enemies have had to pattern after her. They have had to sink their differences and their individualism and achieve a similar socialization of their energies and their efforts, in order to be able to meet the unified force of organized, systematized, efficient Prussia. However much they hate the spirit and the purpose back of Prussian efficiency, they have not hesitated to adopt its methods of control. The Allies are proving to their own satisfaction, and to the satisfaction of the world, that organization, that system and efficiency are not peculiar attributes of autocracy. Russia, as an autocracy, did not possess them. The Allies are proving that such things are just as possible in a democracy as in an autocracy, and that it is the spirit and the purpose of their use which determines whether they are good or bad.

We of the United States have begun to learn our lesson. We have before us the examples and the mistakes of the

European belligerents. We have only to select those measures that are suited to our use and reject those that have been found deficient in war, or not suited to our purpose.

To begin with, we shall have to give up some of our cherished notions regarding the doctrine of individualism, or *laissez faire,* on which our nation and our life were founded. We have already, during our existence as a nation, given up much of that with which we started. We have been more and more achieving a socialization of our efforts because we have found *laissez faire* a costly program. In recent decades the growth of national control has made great strides in our country.

The war promises to give us a still further measure of integration of effort. Like the Allies we shall come out of it a different nation than we were when we entered. It may be that we shall in the end have hit on a happy mean between the extreme of Prussian organization and

system on the one hand and our own comparative lack of them on the other. In any event we shall find that we shall have to nationalize our life and our efforts and abandon, in so far as the common interest dictates, our individualistic hit and miss. The doctrine of everyone for himself and the devil take the hindmost must go. Instead we must have a program of each for all and all for each.

In this connection it is interesting to reflect that Frederick the Great and Voltaire, one of the leaders of the thought that brought on the French Revolution, were friends. Frederick founded modern Prussia. Voltaire influenced the adoption of English individualism, which he admired, in France and therefore, to a certain extent, in America. Frederick implored Voltaire to come to Berlin to live. The latter was more interested in something else. He would not consent to settle down in the Prussian capital, but he did finally make an ex-

tended visit of two years with his royal admirer. They quarreled and parted. Had they not split, they might have influenced and ameliorated each other's ideas, and the world might have then, through them, found the happy mean between the extreme of Prussian socialization and efficiency and individualistic lack of them and thereby been spared its present agony.

In February, 1917, hungry women with hungry children surged up from the poor quarters of New York and stormed the City Hall, crying for food. Unlike the French queen who asked why the Parisian mobs were not given "cake," our officials set about to find the remedy for the situation. The mobs were not fired upon. Police orders were "no rough-stuff." National, state and municipal authorities busied themselves solving the problem presented. In the meantime we drifted into war, and as we have faced the situation we have come to see that our

only salvation lies in an adoption of more or less stringent measures of food control. We find that *laissez faire* will not do, that prices continue to soar, and that we must use strenuous measures to secure an adequate production of necessities for ourselves and the Allies; that prices will have to be fixed and the activities of speculators and hoarders rigidly suppressed. We find we need a centralized national control and direction to coördinate supply to demand and that the utmost of cooperation is necessary between municipal, state and national agencies; that the national interest must dominate and that state and municipal interests must be subordinated. National control is as vital in this matter of food as national direction of the army and the navy. How silly it would seem to us if there could be state interference with the handling of our navy! It should seem just as silly in this crisis to have state instead of national control of food supply, distribution and consumption.

There comes to mind an incident which tells a volume. In March, 1917, some onions were sold in Syracuse, New York. From Syracuse they went to Boston. There the onions were resold, and the car moved on with them to Philadelphia. In Philadelphia they were sold again, and this time the car went out to Chicago. In Chicago it was discovered that the prices in New York for onions were attractive, so they went to New York. There they finally reached the retail shops. Now from Syracuse to Boston to Philadelphia to Chicago to New York is 2472 miles. From Syracuse to New York is about 300 miles. That 2100 extra miles consumed in moving the car of onions from place to place, selling and reselling them, tells a story of American methods. It tells the story of an enormous excess freight bill. It tells of profits being taken on four different and unnecessary sales before the product reached the consumer. That is what happens

when individuals are allowed to do what they like with the foods upon which we live. Under food control the car would have been shipped direct from Syracuse, where there was a supply, to the New York market, where there was a demand, and the price of the onions to the consumer would have been greatly less.

The following figures tell another story. Compare the amount of wheat that Germany got out of an acre of land with the amount of wheat that other countries have produced:

Germany. An average of 30.7 bushels to the acre.

France. An average of 20.1 bushels to the acre.

United States. An average of 14.3 bushels to the acre.

We also find that although our country is fifteen times as large as Germany we produce only the same amount of barley and not quite twice as much oats as Germany; also Germany produces six times

as many potatoes as we do and twelve times as much rice. In other words, Germany gets from the ground the ultimate of production. Thus she is able to sell potatoes in war time for a cent and a half a pound, while we pay six, seven and eight and even as high as thirteen cents, two for a quarter — the retail price to the poor in New York the third week in February, 1917. Taking Germany's production of potatoes, and multiplying it by the relative size of the United States, her potato production would be ninety times as great as ours.

When the war broke out Germany had 5,000,558 farms. We had 6,340,000. Those German farms produced forty per cent more of wheat, rye, barley, oats and potatoes taken together than we, and were on the average fifteen acres each, while ours were 138 acres.

These figures show the thoroughness of German organization as exemplified on the farm. The Allies have made attempts

to equal it, but they have compromised with the question. They have gone so far and then stopped. For example, in Great Britain the government controls all the imported meat. It does not control the meat raised in the British Isles, which is a large percentage of all the meat used there. The government purchases all the imported grain and controls its distribution. It also controls sugar, but there the control stops. The English people are not rationed. Instead they have been put upon their honor to adopt voluntary rationing.

They are supposed to have food cards in their minds and to eat only four pounds of bread, two and one-half pounds of meat and three-fourths of a pound of sugar a week. But they are not *compelled* to do this. They can eat as much as they like, but if they go above that amount they are breaking only an unwritten pledge to the nation. Alas! the pledge is broken; it is broken by nine out of every ten

persons. The government calls on the people to stop hoarding and threatens rationing, but the people do not stop. The government hesitates and is, therefore, unjust to the tenth that keep the faith. Lord Devenport has stipulated that meals in restaurants shall be restricted to two courses for luncheon and three for dinner, and more recently he has put restrictions on the size of courses. But housekeepers have been left on the voluntary system. In other words, the question is dodged. All these half-way measures simply make the gesture of food control. They are not the thing itself. It is the old way of dawdling along, of clinging to traditions, *laissez faire,* instead of coming out squarely and putting control into effect.

Many worn out theories have had to be discarded in the war. Extreme individualism is one of them. France and England have had to socialize their efforts, especially industrially. They had to do

it to meet the efficiency of the Prussian system. Their life today requires direction and control from the national viewpoint. It is being achieved more and more as the war goes on. They have had to mobilize their brain power as they did their armies, fuse its thinking and apply it as a unit. Scattered thinking no longer answers.

We of the United States scarcely realize as yet what a vast change our entrance into the war is going to make with us. But already we have begun to think differently about a number of things. We made a big change in our thinking and our ways of doing things when we switched from our voluntary military system to one of universal service. We will make a bigger one still if we adopt a system of national food control. Such a program would affect every man, woman and child in the country and, properly handled, could be made to teach us many things that as a nation we should know,

and that we should do. We know we owe the farmer a square deal. Let us see that he gets it. We know we must be fair to the honest middleman. But we know that we should suppress the food gambler and the hoarder. Let us do that. And let us be fair to ourselves and obtain decent prices — quit being robbed. Let us learn from the school of European experience and not hesitate to handle the situation without gloves.

CHAPTER III

The German System

Shortly after the outbreak of the war a commission under Doctor Paul Eltzbacher, known as the Eltzbacher commission, made a thorough report on measures for the conservation and control of Germany's food supply. The report dealt with the problem from the standpoint of both scientific agriculture and nutrition.

That the commission was able to report so promptly and thoroughly indicated that preparation had been made for such a work before war was declared. Its report was laughed at both in and out of Germany at the time of its publication, but it was nevertheless the basis of Germany's system of food conservation, which has enabled her to hold out. The report dealt with the nation's food in terms of

calories. It was the first time in history that an attempt had been made to outline a diet for a nation — a war diet though it was, adjusted to the exigencies of the situation.

In the beginning the administration of Germany's food control was placed under the jurisdiction of eight military departments. Their regulations were not uniform, and conflicts arose between them and between the laws of the several states of the German Empire. This system of differing laws and regulations, their administration by military, state and municipal authorities, caused discontent, waste and want in even so highly centralized a state as Germany. The people of Hanover, an industrial center, were compelled, for instance, to go short on butter and eggs, knowing that Bavaria, a farming state, with abundant dairy products, was consuming them prodigally. So Germany's partially centralized system dragged on until the Summer of 1916.

The problem was finally solved by eliminating military and state control. The entire Empire was put under one set of food laws, and a central War Nutrition Office was created. At its head was placed Doctor Adolph von Batocki, known to the world as Germany's "food dictator." He was made responsible to Ludendorff, the Quartermaster General, who is in turn responsible to the Kaiser. Thus the line of responsibility was definitely fixed, and scattering control was at an end. Batocki was given the power to say how much and what kind of food the farmer shall grow, how much keep for himself and how much sell to the state, as well as the price he shall get; which wholesalers and retailers may handle it, and the prices they shall charge the consumer, the latter having his consumption limited by the card system on necessities, insuring to each individual his share.

Germany has a complete system of maps of the soils of the Empire. They

are colored to show the different crops that should be raised in different sections and shaded to show the kinds of fertilizers to be used. For instance, lands growing sugar beets were colored red; lands growing potatoes, brown; lands growing wheat, blue, etc. The agricultural experts studied these lands. They studied the recommendations of the food scientists. They ascertained how much and what kind of food was needed and chose the lands of the Empire on which it could best be grown. They safeguarded against too much of one kind of food and too little of another. They centralized the distribution of seeds and fertilizers to the farmers. When they reported a shortage of nitrates, a fertilizer was made from nitrogen, formerly imported from Chili, but now extracted from the air.

If we are to have a control of food in this country, its director should be able to go to the farmer, as does the German food dictator, and say: "We need so

much wheat, so much corn, so much potatoes, etc. We will take your output at so much a bushel." That would give the farmer a working basis to meet the national feeding needs. Or, as the German would say to a man who bred cattle, "We need wheat more than we need meat. We will buy your cattle at so much a head, leaving you a nucleus for breeding. You will use land formerly given over to cattle grazing for the production of wheat. Your output should be so much. We will pay you so much for it."

One of Germany's principal auxiliaries to farm production has been an intensive cultivation of home gardens. Every back yard, every plot of grass possible has been put under cultivation. Fortunately we entered the war at a time when it was still possible for us to start an agitation for a like movement in our own country. Potatoes, beans, onions, peas, corn and lettuce can be grown in a little garden. These little gardens by supply-

ing tables direct take the pressure off our great staple crops, most of which must be sent abroad. Potatoes are the backbone of a war food diet. Germany has found that out from bitter experience. In 1916 her potato crop was poor, about one-half of that of 1915, when she grew forty million tons. If her potato crop in 1917 were to fail, she would doubtless be in hard circumstances.

If we are to carry the Allies over until next harvest, we must reduce our wheat consumption. That can be done by eating less bread or by using wheat substitutes in bread making. Germany reduced her wheat consumption by using twenty per cent potato flour in her bread.

Germany established a government purchasing department which bought food from the farmers at fixed prices. The department added five per cent for overhead expenses and then sold to the retailer. This eliminated the unnecessary profits of the middleman. It prevented

speculation in "futures" of food and, therefore, prevented the charging of exorbitant prices.

The arm of the German food dictator is longer still. It controls the details of the retailer's business. For the purpose, the Empire is divided into little districts, each shop and market stand in each district being down on paper; also the number of persons in the district. Enough food is released to supply a district. Each shopkeeper can supply only a certain list of people, and he may not sell to anyone outside his district. He must collect food cards for everything he sells in the line of necessities, and these cards have to be surrendered before his stock is replenished.

Not everything is restricted as to consumption. In the main only such articles as are considered necessaries, or staples, are restricted by the card system. Butter, eggs, meat and bread are so restricted. On such things as green vegetables, fruit, fish, fowl and game there are no restrictions;

but such things as are not restricted, especially fowl, are, as a rule, high in price. That means that they are only within the reach of the well-to-do. They make a new class of luxuries.

To adjust the sentiment of the people to a war diet, Germany carried on an "eat and grow thin" propaganda. Educated men who were physically unfit for fighting were assembled in the Reichstag. They were taught the fundamentals of the science of nutrition. When they had learned it, they were sent out to the cities of the German Empire. There they instructed others, and these new teachers of economy went into towns and instructed lecturers there. Town folks spread the doctrines to the rural sections. Thus a great corps of food propagandists reached the housewives throughout the Empire. Women were shown that the individual does not need to eat so much as he had been in the habit of eating to sustain the body in health, strength and

endurance. Pamphlets on food were distributed broadcast. Lantern slides showing food values were flashed on screens. The government published millions of small cook books giving attractive recipes for cooking under war conditions.

While the great mass of the German people are, so to speak, playing the game and following the lead of their government, there are, of course, those who try to take selfish advantage of the situation. But their activities, especially those of middlemen, hoarders and speculators, have been firmly dealt with. The farmer has been the hardest to reach. It is all very well for the government to dictate to him that he shall do thus and so and sell his crops for so much. But if he does not like it there are ways of evading the restrictions. It is notorious in Germany that, whereas there is scarcity of food in the cities, in the country there are supplies if one knows how to find them. And it is even thought among the people that

the government is itself storing food, creating reserves against the last ultimate necessity, taking no chances on a bad crop.

In this connection of failure to be absolutely loyal and honest where food is involved, it is interesting for us to recall the words of George Washington:

Men may speculate as they will, they may talk of patriotism, they may draw a few examples from ancient history, of great achievements performed by its influence, but whoever builds upon that as a sufficient basis for conducting a long and bloody war, will find himself deceived in the end. I do not mean to exclude altogether the idea of patriotism; I know it exists; but I venture to assert that a lasting war can never be supported on this principle alone.

CHAPTER IV

Can England be Starved Out?

There are far-sighted men in England who advocate measures of food control to put England beyond the menace of the German submarine. England has always depended upon the outside world for food; but, if she had to do it, she could produce sufficient crops in the British Isles to feed herself. This is an astounding statement, but it is the conclusion of A. D. Hall, a member of Lord Milner's Committee on Food Production. Mr. Hall's findings regarding the agricultural situation of Great Britain are set forth in his excellent book, "Agriculture After the War."

Today there exists in England a shortage of potatoes. During the first week in May, 1917, they were reported to be

selling for 37 cents a pound. Dry beans brought 25 cents a pound. Sugar was very short. From the scientific viewpoint there is no necessity for such a condition existing. England has yearly purchased from outside the Empire over eight hundred million dollars worth of food, which, if produced at home, would not have lowered her national credit. In other words, because of her policy of "muddling through" England has contracted a far greater national debt than necessary and left herself dependent on the outside world for help.

Let us see what England has done and then see what she could do. Of wheat and wheat flour, England's home production amounts to a little more than one-sixth of her total consumption. Of barley, oats, peas and beans, she imports half from foreign countries. Of potatoes she imports ten and one half million dollars worth annually, which is double the amount of her home production. As Mr. Hall says:

We produce at home considerably more than half of our normal consumption of meat, and of the total imports rather less than one-quarter comes from British possessions. Thus the situation as regards meat is safe enough. Three-quarters of our supplies originate within the Empire, and in a time of real stress the consumption could be diminished in this ratio without harm to the community — the whole fresh milk consumption is supplied by the home producer.

The following table gives a comparison of English home productions and imports:

	United Kingdom	British Empire Overseas	Foreign Countries
	Per cent	Per cent	Per cent
Wheat	19.0	39.3	41.7
Meat	57.9	10.7	31.4
Poultry	82.7	0.2	17.1
Eggs	67.6	0.1	32.3
Butter (including margarine)	25.1	13.3	61.6
Cheese	19.5	65.4	15.1
Milk (including cream)	95.4	0.0	4.6
Fruit	36.3	8.3	55.4
Vegetables	91.8	1.1	7.1

This table clearly shows the extent to which England in the present condition of her agriculture is dependent on outside countries; but England is not growing all the food she can grow. In 1872, for example, the area of England and Wales under the plow was 13,839,369 acres. By 1914 it had fallen to 10,306,467 acres, a loss of 26 per cent. This land, withdrawn from agriculture, was grown to grass. It was used for the raising of live stock. But Mr. Hall conclusively proves that "the crops from land under the plow when used for feeding cattle will produce of either meat or milk more than twice as much as the same land will yield when under grass." In other words, by planting 26 per cent of the land of England and Wales with grazing grass, England has lost an incredible amount in nutrition. This could be regained even now, if she has the labor to accomplish it.

England has failed to reclaim land as Germany has done. In Germany the cul-

tivation of waste lands, moor and heath, was taken in hand in increasing areas year by year. In one small province, for example, Oldenburg, an average of sixty settlers per annum were put on reclaimed land, the number rising to over one hundred and sixty per year beginning with 1911. Each settler cultivated twenty-five acres of new land for the country. In England there is this same kind of waste land that could be used. With the exception of a few little farms bitten out of the waste on the flanks of the forest nothing has been done. Properly drained, cleared and fertilized, this land could produce food-stuffs that would enormously reduce British imports. Advocating the production of wheat, Mr. Hall says:

It would be our aim, however, to increase the wheat as much as was consistent with good farming, because from the point of view of national safety, wheat is the absolutely necessary food of which a large stock must be maintained in the country.

If a real crisis came and the country were threatened with starvation, not only could the ration of meat be materially reduced without danger, but there would always be a large reserve of meat in the country in the shape of the breeding flocks and herds. *A given area of land in the form of corn and other vegetable materials will in time of real need support about eight times as many men as will the meat obtainable from the same land. From eight to ten pounds of absolute food of vegetable origin are consumed in making one pound in the shape of meat; in other words, a vegetarian population can exist on the produce of one-eighth as much land as would be required by purely meat-eaters.*

If the acreage of land under the plow were restored to the position it occupied in 1872, the home production of wheat would be raised to 57 per cent of all the requirements of the British Isles. A table in acreages evolved by Mr. Hall tells the story. It is significant that he has reached this result even leaving Ireland out of the

calculation, because, as he says, in Ireland, "Any rapid extension of tillage is difficult of attainment. On the large grazing holdings there are neither men, implements, nor knowledge of arable cultivation."

His table, which follows, shows how England could increase her crops:

	England and Wales			Scotland			Total
	Actual	Proposed	Gain or Loss	Actual	Proposed	Gain or Loss	Gain or Loss
	Thousand Acres			Thousand Acres			
Wheat	1,807	5,000	+3,200	62	200	+140	+3,340
Barley	1,505	1,400	−100	192	250	+60	−40
Oats	1,930	2,600	+670	957	1,200	+250	+920
Beans	294	500	+200	9	9	...	+200
Peas	169	500	+330	1	1	...	+330
Potatoes	462	550	+90	150	170	+20	+110
Roots and green crops	1,739	1,900	+160	440	440	...	+160
Other crops	300	300	...	10	10	...	...
Bare fallow	341	100	−240	7	7	...	−240
Temporary grass in rotation	2,381	1,800	−580	1,468	1,000	−470	−1,050
Permanent grass	16,116	12,400	−3,700	1,496	1,496	...	−3,700
Total	27,044	27,050		4,792	4,783		

The crux of the question of national security in time of war he regards as wheat.

In the United Kingdom there are forty-seven million acres of cultivated area. To replace the imports and maintain the cattle food at present derived from grass land would mean that nearly all of these forty-seven million acres would have to be transformed into arable land. This is an ideal toward which far-sighted Englishmen are working. It is not impossible, for in Denmark in 1912 $89\frac{4}{10}$ per cent of the agricultural area was arable land. By a liberal use of fertilizers an expensive program at first, there is no reason why England could not reach the same percentage as the Danes. The project of arable farming is limited by the average price of the chief products — wheat and meat, for example — and the price of labor.

More and more has every government in this war come closer to the socialized state. A guarantee of maximum and

minimum prices to farmers by the British Government would give them the confidence to put through this project of making England self-supporting. The spirit of national preservation that has been developed in England during the war should lead to an acquiescence by the farmer in allowing the government to take a hand in the production of his food-stuffs. A sign of the times is that cabbages and potatoes are now being grown in the historic gardens of British sovereigns.

Great Britain possibly lacks the men for such a program at present, but, as indicated in Mr. Hall's book, it is a perfectly possible proposition to make the British Isles independent of the rest of the world for food. But as the situation stands, it is necessary for us of America to furnish Great Britain the food that she lacks and not cause a diversion of her energies at this time from the immediate prosecution of her offensive warfare.

CHAPTER V

Our Problem and its Solution

The uncultivated areas of the United States are great. Our areas that grow only grass for grazing are vast. Our proportionate area of land under the plow is discouragingly small. Our deficiencies in farm labor are a peril. Our lack of economy, our treatment of the farmer in the matter of prices — these are but some of the problems that confront us. They can be solved as Germany has solved them. We can learn from what has been done in the British Isles, in France and in Germany. The methods that other nations have used are for us to examine.

Let us calmly face the facts of our own situation. Our food production has not kept pace with the growth of our popu-

lation. This is not a condition new with the war. It was giving our agricultural experts alarm before 1913. In the last thirty-five years Americans have concentrated increasingly in cities. For example, from 1880 to 1910 the percentage of increase in urban population was 188.5. The increase in rural population was but 39.4. This has meant a decrease in the per capita production of staple food products. For example, wheat dropped from 8.5 bushels per capita in 1884 to 7.7 bushels in 1914.

This is all the more significant because the concentration of populations in cities requires an increase in staple food products. Also the rate of increase of cattle, sheep and swine slowed down as our population grew. Besides we have been steadily forced to decrease the amount of food-stuffs exported. For thirty years before the war we were steadily losing our ability to produce and to export foods.

But with the war the high prices that Europe was willing to offer for foods caused a marked increase in our export of food-stuffs. The 1916 exports of our great crops and animals jumped 177 per cent over 1914. Our manufactured food-stuff exports for the same period increased 103 per cent. These figures might indicate that American agriculture was responding to the new demands. That was not the case. We did not increase our ability to produce food. We merely sold out what we had and we killed off our stocks of animals.

In 1916, with bad weather conditions, our crops were short. We were short, for instance, 88,339,000 bushels of wheat. This was reflected in May, 1917, by Chicago wheat, on speculation, soaring to three dollars a bushel. We were short 75,000,335 bushels of potatoes, and the price in February, 1917, jumped as high as thirteen cents a pound, two for a quarter. That was more than eight times as

much as the fixed price for potatoes in Germany.

These few figures show that our great exports of last year were due to exceptional weather conditions in 1915; for with poor conditions in 1916 we faced stringent shortage in the spring of 1917. In other words, it was due to no measures of food preparedness on the part of our country that we were able to export what we did.

Farm hands have gone to work in munition plants. Near the great munition center of Bridgeport, Connecticut, it has been possible to pick up farms for ten dollars an acre. Milkers and farm hands, who formerly worked for twenty-five to thirty dollars a month, prefer to work in factories for $3.75 a day. The wages of forty-five to fifty dollars that farmers, desperate for help, have offered, do not appeal. In the munition plant a man works eight hours; on a farm, twelve or more. Because of that labor condition

Professor Alva Agee, Secretary of Agriculture of New Jersey, declares that the potato crop of 1916, which was ten million seven hundred thousand bushels, — one million less than 1915, — was 75 per cent greater than the crop for 1917 will be. Because it is impossible to obtain help, farmers are killing off their livestock. Therefore, the production of meat last year exceeded that of 1914 by three billion pounds. This constitutes a great danger. Even the Chicago packers have sounded the alarm by advocating "meatless days" for the United States. England, France and Germany have them. Why not we?

Our supplies of food in cold storage have fallen off enormously. On March 1, 1917, there was a decrease of 29.3 per cent from American cheese held in cold storage March 1, 1917. The reserves of eggs dropped 86.3 per cent; lard, 31.7 per cent; lamb and mutton, 31.1 per cent; and frozen pork, 36.9 per cent.

We cannot get away from these figures. They show us that we face the present crop year with our reserves almost exhausted. They show that we are entirely dependent upon our fields and farms for the food of 1917 to carry us through the winter of 1918, and we have not only to feed ourselves but to help feed the Allies. The Department of Agriculture, April 1, 1917, estimated the winter wheat crop to be four hundred and thirty million bushels. It is the lowest ever recorded. It is doubly significant when we consider that two-thirds of our wheat crop is winter wheat. On this basis our total 1917 crop will hardly exceed the disappointing crop of last year. England's crop is reported to be only three-eighths of normal. France's is about seven-eighths of normal. Holland, Denmark, Sweden, Norway, Switzerland raise little or no wheat. Australia and the Argentina cannot help as in normal times. Ships are now so very scarce that they must be used only on

the shortest routes. What are we going to do?

America has produced over a billion bushels of wheat in a single year, and by properly directed food production, centralized control of labor and fertilizer supplies, and utilization of abandoned farms and waste lands, we can produce that amount again. We cannot do it by talking. The need of the hour is an aggressive, constructive policy enforced by a big man.

Professors Henry R. Seager and Robert E. Chaddock of Columbia University have made a valuable contribution to food preparedness. In the Columbia Alumni *News* for May, 1917, they published an article that should be reprinted by the government and spread broadcast. To quote briefly:

As a first step towards relieving the shortage of farm workers a survey should be undertaken in the principal agricultural States to determine the number of

farm workers that will be required. The already existing machinery of public employment bureaus may then be utilized to address a nation-wide appeal to all those competent to do agricultural work to turn to it this summer as the surest means of serving their country in its hour of need. If sufficient workers can not be secured by these means, the same machinery which is being developed to enlist men for the army and navy may be employed to induce some of them to turn to agriculture as an equally important branch of the national service. When conscription is substituted for voluntary enlistment, the drafts may be made larger than mere military service requires, and those called into service may, if qualified, be given the choice between fighting for their country or farming for their country. No doubt many who are disqualified for military service not only will be found fitted for agricultural work, but will benefit by the healthful outdoor life and be upbuilded physically by it. Machinery may also be profitably developed for using the graduating classes of our schools and colleges of agriculture to train these recruits to

the farming industry. There would probably be little or no difficulty about adjusting their compensation, since the scale of farm wages already compares favorably with that of soldiers and sailors, and is advancing.

Even more urgent than a survey of the labor situation is a survey of the seed and fertilizer situation. Farmers are already complaining of difficulties in connection with the procuring of seed and of the great advance in the price of fertilizers. Seed and fertilizer should be made available for every farmer competent and able to use them to increase the country's food production. The Department of Agriculture has nearly two thousand traveling agents, besides tens of thousands of crop reporters throughout the country. The State experiment stations have many farm demonstrators and other trained employees. These should be able, if their work were properly coördinated, to collect the necessary facts in a comparatively short time.

Pending such a survey of our available seed resources, deliberate curtailment of our consumption of potatoes might be ad-

visable until the spring demand for seed potatoes has been fully satisfied. Also the wider treatment of seed to insure immunity from rust should be brought about by the Department of Agriculture.

The best agency for assisting farmers to procure the seed and fertilizers they require would seem to be the recently organized Federal Farm Loan Board. Announcement has already been made that it was preparing to lend large sums to farmers during the current year. The need is so pressing that farmers should not only be assisted with loans on reasonable terms, but, where the experts of the Department of Agriculture so advise, they should be urged to make them rather than to sacrifice the efficiency of their farming operations. Incidentally, the expert agents of the government should assist farmers to a wiser selection of seed and fertilizers than they have been in the habit of making. There may also be need for some regulation of the profits of seed and fertilizer companies, since the temptation to take advantage of the situation to exact unreasonably high prices is undoubtedly strong. As a general principle, there

would seem to be just as much reason to protect the producers of our essential foods from exploitation in war time, as to protect the government itself from exploitation in connection with its purchases of war material. It is not a time for taking advantage of one's neighbor, but for whole-hearted national service — not only in the army and the navy — but in every field of human endeavor.

Fear of falling prices, before crops can be harvested and sold, is the last serious check to increased food production. Current reports from the Department of Agriculture indicate that this has not prevented farmers in nearly all sections from increasing the areas they are bringing under cultivation. If there should later develop any curtailment in agricultural activity, due to anxiety about prices, the government might well follow the example of European states in guaranteeing generous minimum prices for staple products like wheat, corn, rye, oats, barley and potatoes. If it were later com-

pelled to buy in some of these products to maintain the prices it had established, it could readily dispose of them to its European Allies. Any loss which it might incur would be a small insurance premium to pay for protection against scarcity of essential food-stuffs later.

With a strong centralized system of production we can have enough food, but it must be distributed properly. Such systems of distribution have already been worked out in the war. Consumption must also be watched. Nutrition experts agree that at most the man doing ordinary sedentary work needs but twenty-five hundred calories of food a day. It will help the individual to reduce this scientific formula to something tangible. For example, Professor Irving Fisher of Yale and Doctor Eugene Lyman Fisk of the Life Extension Institute, in their book "How to Live," tell us that in a small lamb chop weighing about an ounce we find one hundred calories. The same

number of calories are contained in a large egg, in a small dish of baked beans, in a piece of cheese about one and a half cubic inches, in an ordinary side dish of sweet corn, in a large boiled potato, an ordinary thick slice of bread, a shredded wheat biscuit, a large dish of oatmeal, a small piece of sponge cake, a third of an ordinary piece of pie, in a lump and a half of sugar, in a dozen peanuts, in eight pecans, in four prunes, in two apples, in a large banana, in half a cantaloupe, in seven olives, in a very large orange, in an ordinary pat of butter, a small glass of milk, or a quarter of a glass of cream. Each one of these articles yields one hundred calories; twenty-five hundred calories is all that is needed on the average for one day.

Professor Lusk of Cornell and Mr. Gephart of the Sage Foundation have outlined an interesting table in their booklet "Analysis and Cost of Ready to Serve Foods." They checked up in a cheap

restaurant the prices and the number of calories contained in different dishes. For example, a portion of cornmeal cakes with maple cane syrup contains five hundred calories and costs ten cents. In the form of corned beef hash with a poached egg, the same five hundred calories cost twenty cents. In other words, the man spending the dime, as indicated, got just as many calories of food as the man spending twenty cents. Also they show that there are but few calories in such things as tomatoes, lettuce, oysters, sliced pineapple, stewed corn, cream of wheat and cantaloupe, in proportion to their cost. Thus fifteen cents worth of oysters, a half dozen, yielded only 50½ calories, whereas five cents worth of crullers contained eight times as many calories at one-third the price.

Now in our problem of what kind of foods to consume, we must consider that it is difficult to ship some things abroad on account of their perishable quality or

bulk. Potatoes particularly are such a food. Therefore let us eat more potatoes and less wheat, which is better fitted for overseas transport. Let us eat quantities of green vegetables and lightly of meat, which is demanded abroad and which can be more easily transported. We ordinarily eat much more meat than we need. The leading men of nutrition of the world agree that only ten per cent of our food need be protein. Most of us obtain our protein supply from meat instead of other food-stuffs. According to Doctor Hindhede of Denmark it is impossible to get too little protein in food-stuffs. It is universally present in sufficient degree. Even Professor Rubner of Berlin, who is of the old school of nutrition, has written: "On account of false notions of the strengthening effect of meat, too much meat is used by young and old and this is harmful. Flour foods, vegetables and fruits should be eaten in place of the over-large quantities of meat." When so ultra-

conservative a food authority as Rubner insists that we use too much meat, we can safely follow his advice; for he is a reactionary.

The Department of Agriculture has put out some healthful hints on food conservation. It should go further and issue war cook books, based on ideas of scientific nutrition and designed to work the greatest possible economy in food consumption. Such books should give detailed recipes for all kinds of food.

CHAPTER VI

How the Individual can Help

As we shall send most of our great staple crops to Europe, the needs of American tables should be taken care of by the small farms and by little vegetable gardens. The individual with ever so small a patch of land can help. Upon it he can grow the foods that are not desirable for shipment to Europe, especially green vegetables and potatoes.

The garden idea has already taken hold. In Madison, Wisconsin, in Chicago and in many other places vacant land has, with the coöperation of the city, been turned over to families willing to cultivate it. In Madison one family cultivated a plot fifteen by forty-four feet. On it they grew fruit trees, raspberries, grapes and all the vegetables they needed

for their own table. In home gardening there is an opportunity for millions of American families to help the government conserve food supplies and at the same time to cut down the cost of living. All that needs to be done is to utilize a back yard. If you have no yard, apply to the city authorities for the privilege of using some part of a vacant lot. Commissions have and are being formed to meet the land demand and to show city men what to plant, how to plant it and how to take care of it. Chicago had thousands of applications for the land that the city decided in April, 1917, to open for cultivation.

Charles W. Holman, Secretary of the National Agricultural Organization Society, has made some excellent observations on this kind of gardening that should be of value. He says:

England goes about home gardening with more statesmanship and vision than we have yet attained. While in England

recently I had occasion to look into this movement, for it is one of the flowerings of the coöperative idea, and several large arms of the government are now turning to the doing of this work of encouraging workers to secure gardens and to till them.

About six hundred thousand allotments, as they are called, have been let to persons throughout the British Isles, and some thirty-five thousand persons now hold gardens by means of coöperative societies. The movement has taken firm root there, and is one of the subtle forces that are surely remaking the old into a new England. The movement is affording a new hope for the worker, a new hope for his wife and a new hope for his children. It is doubly attractive as it affords a way of going back to the land without leaving one's city job. It turns a splendid recreational trick and aids materially in splicing out one's allowance for food.

Every evening in the tillage season one may see hundreds of workers hurrying from factory or mine or shop to the unhoused places which English county councils are consecrating to garden purposes. There they work during the long days

until time for the late English meal. On Sundays, too, one finds them in their gardens, just as one finds the golfer among the more prosperous classes. They grow vegetables, fruits and flowers. Sometimes they grow for their own consumption, but now and then a family raises surplus products and sells them in order to have money with which to buy meat.

The idea is bigger than mere gardening. It signifies the purpose of the government to provide as much land as possible for the landless. It betokens a most decided victory of the landless class and a change in governmental policy that virtually amounts to a crumpling of the wall of unjust discrimination which for centuries has shut out the farmer from owning his land and the city dweller from owning his home.

With the realization that there is not enough land to go around, the people of England have attempted to find a substitute for the back-to-the-land craving — and they fell upon the allotment garden.

Within a year after the movement had begun, 21,500 persons applied for land,

but the local governmental authorities did not exert themselves to meet the needs, and only 6147 were provided. By the end of 1915, however, some thirty thousand persons had been provided with land under the new plan and some forty thousand acres had been leased or purchased. In 1916 thousands more were added.

While over half a million persons were already on allotments in 1917 the demand for gardens and tillage spaces of small area was so great that Parliament passed an act known as the Allotments and Small Holdings Act. It created a body of commissioners, who, under the direction of the Board of Agriculture and Fisheries, have the duty of satisfying the demand of workers for allotments.

To do this the commissioners are empowered to put the necessary pressure upon county councils and make them carry out the spirit of the act. The councils, by the terms of the act, are empowered to condemn and acquire any tract

of land in private ownership down to fifty-acre demesne, when such land may be needed for allotments. The councils may either rent the land or buy it outright, and the law provides a method of financing the purchase. In event of failure on the part of councils and owners to agree as to price, a public valuer is empowered to act as adjudicator. His decision is considered irrevocable.

The effect of the new compulsory cultivation of land act, now in operation under the Lloyd George government, cannot fail to give great impetus to the garden movement, as many thousands are desirous of making gardens, but have not been able to get the land on account of reluctance of the landed class to part with their holdings.

Shortly after the act became operative it was seen that the urban and district councils, who have immediate charge of the rentals as agents of the county councils, would have much trouble with renters

on account of the small tracts and the great number of persons to look after. Accordingly the authorities began to look about for some method of meeting the difficulty.

This led to the birth of the coöperative society for allotment renting. Such societies were not new. In Italy the cooperative renting societies have flourished for many years. But the application of the idea to city workers, it must be admitted, was a new wrinkle. The government assigned the duty of aiding coöperative allotment societies to the Agricultural Organization Society, which in England is a partly subsidized institution for the advancement of agricultural coöperation.

This society had been created in England after the plan of the world-famous Irish Agricultural Organization Society, which was started over twenty years ago by Sir Horace Plunkett. At the head of the English body is J. Nugent Harris.

Harris had already become interested in the coöperative land-renting idea and saw possibilities in the plan as a means of increasing England's food supply. With quick intuition he also grasped the fact that local authorities were not enthusiastic, and to be moved needed the tongue of persuasion and the prod of public opinion.

Thereupon Harris set about organizing public opinion locally, and had no difficulty at all in forming over two hundred and fifty coöperative allotment societies to rent gardens when they could get the land. By means of the societies and the lining up of organized labor locally many of the reluctant councilmen found themselves forced to acquire the land or become most unpopular if they did not do so.

These societies are organized as coöperative corporations under the Industrial and Provident Societies Act. The coöperative corporation is a new kind of cor-

poration in America, only about twelve thousand being in existence in this country. It is a democratic corporation, and each shareholder has only one vote, irrespective of the number of shares he may own. It follows that when a coöperative corporation becomes a tenant of land its shareholders will have but little difficulty in working together.

When a group of Englishmen wish to acquire city gardens their first step is to make their wishes known to the Agricultural Organization Society, which sends an organizer down from London to look into the situation.

They are really industrial and agricultural evangelists; they are of the new order of men. The organizer makes a careful study of the situation, and particularly of the applicants. He ascertains where land might be available and desirable. He instructs the leaders, arouses the membership, and points out to them their difficulties and the neces-

sary lines of procedure. The councils prefer to rent land to societies, for the trouble is considerably less than the old way of renting to individuals. This English system is worth studying.

The far-sighted men of our government are looking forward to push this idea of home gardening. United States Commissioner of Education Claxton has worked out a plan for utilizing school children in gardening. His idea is:

Much of the gardening might well be done by school children between the ages of nine and ten and sixteen. With a garden of five or six hundred square feet, a boy or girl twelve years old should be able to grow fifty dollars' worth of vegetables and small fruits, that would not interfere in any way with regular school work and would not encroach too much on the hours of play. The educational value and the gain in health, strength, and real joy in life will be much greater than the money value of things grown. One teacher who knows gardening, knows how to manage

boys and girls and is not afraid to work, can, by using afternoons, Saturdays, and vacation days, direct the work of one hundred and fifty children and of as many of the older members of their families as will join in the work. The additional pay to the teacher for this work should be from three to six hundred dollars, less than ten per cent of the money value of the food produced by those working under his or her direction.

This is a matter of great present and future importance, and should be undertaken in such a way as will insure its permanent success. Sooner or later it must become an integral part of all urban school work. In a recent discussion of the high cost of living in the United States Commissioner Claxton suggested school gardening as an adjunct to food preparedness and said:

In the schools of the cities, towns, suburban communities, and manufacturing and mining villages of the United States there are approximately six million boys

and girls between the ages of nine and sixteen. Most of them are idle more than half of the year. They are in school less than one thousand hours in the year, and allowing ten hours a day for sleep, are out of school more than four thousand waking hours, more than an average of nine hours a day, not counting Sundays. National and State laws make it impossible for most of them to do any profitable work in mill, mine or shop, and many of them are forming habits of idleness and falling into vice. Even during the vacation months only about ten per cent have any profitable employment; only about five per cent of them go away from their homes except for a few days. Still they must live and be fed and clothed.

For four millions of these there is access to back yards, side yards, front yards, and vacant lots, which might be cultivated as small gardens for the growth of vegetables and small fruits. Many live where space could be easily had for chickens, ducks, or pigeons. And there are not less than six million older boys and girls, also adult men and women, for whom an hour or two of work each day in a garden

would be the best form of recreation and rest from the routine of their daily labor in office or shop or mill or mine, and who might easily find the time for it.

It is obvious that with some intelligent direction these school children and older boys and girls and men and women, as Commissioner Claxton says, might easily produce on the available land an average of seventy-five dollars each in vegetables and fruits for their own tables or for sale in their immediate neighborhoods. They could grow fresh and crisp stuffs through all the growing months and wholesomely can and preserve foods for use in winter. This would add seven hundred and fifty million dollars to the best form of food supply of the country without cost of transportation, or storage, and without profits of middlemen. The estimate is very conservative, as has been shown by many experiments.

According to the Department of Agriculture, boys and girls raised last year

from home gardens more than four million pounds of valuable food. The home garden should be kept working all season. Early crops can be hastened by planting in boxes, in hot beds and cold frames. If the weather prevents outdoor planting, lettuce, radishes, beans, and other short-seasoned crops should be started as soon as the days grow milder. Toward fall the garden should be growing potatoes, beets, turnips, cabbage, and other hardy food that can be stored throughout the winter. Every can of vegetables or fruit means that you have saved valuable food material that would otherwise have been wasted.

Another way to help is to watch kitchen and table waste. The Department of Agriculture estimates that seven hundred million dollars worth of food is wasted every year in American homes. It is wasted if it gets into the garbage can; if allowed to spoil in the home; if ruined by careless cooking; if it is wasted by

careless paring and trimming; if it is served over-generously at meals. The food specialists of the Department point out uses for left-over cereals, stale bread, skimmed milk, sour milk, scraps of meat and fish, bits of fat or suet trimmed off by the butcher, or thrown away by the housewife.

If you are interested in food economy and want to know how to get the proper food and not too much of it, write to the United States Department of Agriculture and ask for Farmer's Bulletin 808, "How to Select Foods; What the Body Needs." This pamphlet, the result of the work of experts, classifies food into simple household groups and shows how to plan meals that will provide all the requirements of the body at minimum expense.

The habit of indiscriminately feeding leftovers to chickens and pigs should be eliminated. The major part of the left-overs of the table can be reprepared for

human consumption, and it is a waste to feed food fit for humans to animals. There are cheap foods for both chickens and pigs upon which they should be fed instead of from humanly edible scraps from the dining-room table. Still another waste occurs in the home from the American trait of wanting to satisfy the eye as well as the appetite. The average man who is a "good liver" likes to sit down to a table covered with dishes heaping with food in variety. And just as the average American likes to see plenty of food on the table, he also likes to pile the plates with it, frequently serving enough food for three persons to one individual.

How much does a man need to eat? The daily food requirement of an average man has been worked out by the United States Department of Agriculture as follows:

One and one-fourth pounds of bread (having about the same food value as

one pound of such cereal preparations as wheat or rye flour, oatmeal, cornmeal, rice, etc.).

Two ounces, or one fourth cup, of butter, oil, meat drippings, or other fat. Two ounces, or one-fourth cup, of sugar; or one-third cup of honey, or syrup, or an equivalent amount of other sweets.

One and one-fourth pounds of food from the following: Fresh fruit and fresh or root vegetables.

Twelve ounces of food from a class which may be called "meats and meat substitutes"; that is, moderately fat meats, poultry, fish, eggs, cheese, dried legumes (beans, soy beans, peas, lentils, cowpeas, and peanuts). Milk also belongs among these foods, but because of the large amount of water it contains, half a glass, or four ounces, of it would be required to equal an ounce of any one of the others.

A man who works hard out-of-doors all day probably would need more food

than this, and one who sits all day at his desk would need less. The amounts given are suitable for a man who, like a salesman in a store, walks about and does more or less of such work as lifting.

The above formula amply supplies the body needs of the average man. He could get along on less; also there are some men doing very heavy muscular work who would need more. It is to be considered, however, that the average man is given much more food than that daily. It is these extra ounces of food, nothing in themselves but multiplying enormously when the nation is concerned, that make our waste so appalling. If each of America's twenty million families waste only one ounce of meat daily, this means one million two hundred and fifty thousand pounds of valuable animal food, or the gross dressed weights of over eight hundred and seventy-five thousand heads of cattle, or three million hogs. If every one of the country's twenty million homes

wastes on the average only one slice of bread a day, the country is throwing away daily over fourteen million ounces of flour, eight hundred and seventy-five thousand pounds, or enough flour for over one million one pound loaves a day. For a full year at this rate there would be a waste of over three hundred and nineteen million pounds of flour, or one million five hundred thousand barrels, enough to make three hundred and sixty-five million loaves. As it takes four and one-half bushels of wheat to make a barrel of ordinary flour, this waste would represent the flour from over seven million bushels of wheat.

The rich can help by eating luxuries and leaving staples, so far as possible, for the poor and for export. Germany uses this idea. Prices of staples are rigidly controlled and kept within reach. The prices of other foods are left to regulate themselves. Medium-priced foods in the United States in relation to their nutri-

tive value are such things as beans, peas, onions, butter, eggs, lettuce and all green vegetables. The cheaper nutritious foods are such things as rice, oatmeal, brown and black beans, oranges, apples, corn-meal and fish. Potatoes are high in price but will be lower. They will have to be. The government must see to that important matter.

In Germany potatoes are the backbone of the diet of the poor and cost but about one and one-half cents a pound. When they are scarce turnips are used as a substitute. Potatoes are easily and cheaply raised. With care and skill from three hundred to five hundred bushels can be grown on a single acre of land. With every back yard garden growing some potatoes, such individual help will be of enormous value to our country in the war. A valuable little booklet on potato culture, reprinted from the reports of the Pennsylvania State Department of Agriculture, may be had by writing the Gen-

eral Freight Office, Pennsylvania Railroad, Philadelphia.[1]

[1] Other pamphlets (reprints of reports by the Pennsylvania Department of Agriculture and the State Agricultural College that may be obtained from the General Freight Office of the Pennsylvania Railroad, Philadelphia, Pa.) are: "Corn Culture," "Your Dairy Farm," "Beef Production," "Seed Grain Suggestions," "Alfalfa."

CHAPTER VII

Applied Scientific Nutrition

The war has developed new knowledge on many subjects, military, naval, agricultural and industrial, but on none more than food. In the latter case the economies of nutrition that have been practised in the war, have proven a vindication of scientific theories that before had only been tested in the laboratory, or tried out by individuals independently. In the case of Germany at least we have witnessed a whole nation on a diet — a war diet, though, it is, and not strictly a scientific one, it is true, but nevertheless as nearly so as the exigencies of food supply would permit. And again in the case of Belgium, under the efficient management of the American Relief Commission, we have

seen these theories applied and tried out on a vast scale and even more thoroughly.

During the fifty years prior to the war the German had become the largest per capita consumer of meat in the world, surpassing in that respect even the citizen of the United States and "beef-eating" England. And according to Doctor M. Hindhede of Copenhagen, who has spent his life studying matters of nutrition, the death rate before the war among German men (infant and female mortality excluded) had risen to the astounding rate of 18.2 persons per thousand of population per annum. He points out that on simpler fare the death rate in German prisons was much lower. Previous to the war New York City held the world's record for low death rate. It was somewhere around 14.5 per thousand per annum. In the war the death rate in Berlin, according to official statistics, dropped to 12.3, and the statement was published in Berlin that London, under the mere restriction

of higher prices, achieved an even lower death rate in 1916, the figure given being twelve. Their information doubtless came from London sources.

But the most remarkable accomplishment of all was that obtained by the American Commission for Relief in Belgium. According to Horace Fletcher, the American food economist, who was in Belgium when the war broke out and who was made a member of the Belgium Relief Commission, the death rate in Belgium under diet prescription was reduced to eight in a thousand per annum. That is almost half of New York's pre-war record for low death rate. Fletcher was partly instrumental in the adoption of the food standard of the Commission. According to it, the Belgians did not receive the three thousand calories a day called for by the old standards, except in the cases of those doing hard physical labor. Persons doing no work at all received as low as seventeen hundred calories a day

and only ten per cent protein. The meals were served at a cost of about seven cents each, and not only was health improved, as indicated by the lowered death rate, but the common diseases of civilization were all but eliminated and the Commission was saved millions of dollars of expenditure for excess food.

The German people have lost a billion pounds of fat from their bodies in the war, principally due to the fact that fats as food are about the scarcest thing in Germany, being needed for making nitroglycerine. They naturally view their restricted diet as a hardship, but, like a patient put on a diet by his doctor, they have found that it is not so bad after all. Their health at least is better.

Before the war Germany mobilized her information and the information of the scientific world on the subject of nutrition. Much of what they knew came from America, the results of the work of such men as Professors Chittenden and Fisher

of Yale, Lusk of Cornell, and others. On the Eltzbacher Commission, made up of scientists of both the old and the new school of nutrition, there were also followers of Doctor Hindhede, the Danish food expert, who advocates a low-calorie standard, an average of twenty-five hundred a day, and a content of not over ten per cent protein. Prominent among them is Professor Boas, who has done much lecturing and writing on the subject during the war. The Germans take such matters seriously, and there are probably more people there today who are conversant with nutrition from the scientific viewpoint than in any other country in the world. The war and the scarcity of food have helped to force the matter on their attention.

That no measure of food economy is overlooked in the war is indicated by the fact that " Fletcherism," or that part of it which covers thorough mastication and insalivation of food, is advocated as a means

of increasing the nation's ability to hold out. In furtherance of such propaganda Doctor von Kersting of the German General Staff published a pamphlet entitled: "Germany, Fletcherize!", which has had a large distribution.

The Voit standard of nutrition, so called because of its establishment by Carl Voit of Munich the middle of the last century, is the one according to which, without knowing it, people commonly live. It calls for a consumption of three thousand calories of food daily by an adult in ordinary occupations, the total being made up of one hundred and eighteen grams of protein, the cell-building element in food, found principally in meats, fish, eggs, beans, peas, etc.; fifty-six grams of fat and five hundred grams of carbohydrates (sugars and starches), the fuel and energy foods. It admits that fewer calories may be sufficient for a man at leisure, but advocates four thousand to five thousand calories a day for those strenuously employed.

Hindhede says he has himself lived on twenty-five hundred calories a day, made up of potatoes, margarine and cereals, at a cost of a quarter of a Danish crown, or about seven cents a day; that during the eight weeks which he restricted himself to that diet he never felt better in his life, and he tells of a terrific bicycle test to which he put himself without fatigue; because he was " poison free " of protein.

Hindhede freely credits Fletcher in his book " Protein and Nutrition " as having been the pioneer in the reformation of the old diet standards, his action having brought about the experiments of Fisher and Chittenden of Yale, whose investigations dealt " a mortal blow to the old faith in a maximum protein requirement."

Professor Chittenden, a follower of the Voit standard, was won over as a result of his experiments with Fletcher, who subsisted during the test on a low protein diet, about half the Voit standard, as follows: Protein, 44.9 grams; fat, 38; and

carbohydrates, 253; a total of 1606 calories a day, instead of Voit's 3000. "We have here," said Professor Chittenden, "a striking illustration of the establishment of nitrogen equilibrium on a low protein diet, and great physiological economy as shown by the low fuel value of the food consumed, coupled with remarkable physical strength and endurance."

Professor Baeltz, for some time physician to the Mikado, in reporting on experiments made with the Japanese, says: "I had two jinrikisha men. Every day they had to drag me, a man weighing 176 pounds, a distance of 24.84 miles, running all the time. The men kept to their usual diets, which contained fats amounting to less than half that proposed by Voit, while the contained protein fluctuated from between 60 to 80 per cent of his postulate. Carbo-hydrates, on the other hand, were provided in exceedingly large quantities, in the form of rice and potatoes, barley, chestnuts, lily-roots and other food-stuffs

peculiar to the country." Professor Baeltz substituted for the carbohydrates a proportionate quantity of protein in the form of meat, and he says: "After three days they came and asked me to discontinue the meat because they felt so fatigued and could not run so well as before." The population of Japan eats little meat, and fish only once or twice a month. Fifty million Japanese consume sixty million pounds of meat a year, a little over one pound per person per annum. Rheumatism, according to the *British Medical Journal,* is almost unknown in Japan.

Doctor Bernard Auzimour, a French doctor who has made a study of the Arabs, writes: "The frugality of the Arabs is just as far-famed as is that of the camel. Men often go on long journeys into the desert, with only a bag of meal, some figs, a skin of water and some dates. The fare is nearly always vegetable, plus a little milk, and, very rarely, a little meat. The

Arabs are very hardy and very resistant to disease. Abdominal wounds, with perforation of the intestines, heal without the use of antiseptics. Wounds, healing in such circumstances and without consequent blood-poisoning, are a source of wonder to surgeons acquainted only with Europeans. Diseases of nutrition are almost unknown; ulcers and cancer of the stomach are very seldom met with; and if one comes across a chance case of summer diarrhoea, it is generally because the sufferer has been eating too many melons. Appendicitis is very rare among Arabs, and is entirely unknown among the vegetarian Nomads. Gout and kidney gravel are also quite unknown."

Science has shown us that we do not need foods rich in protein; that we commonly overeat; that we would be much healthier with a larger proportion of carbohydrate foods; and these theories have been borne out and vindicated by the food economies of the war. There is

here a hint for us of the United States for a measure of food economy that will not only work a saving for the pocket-book, for high protein foods are as a rule the expensive foods, but a measure which, if practised consistently, would result in better health and a lowered death rate. Nutrition experts maintain that more people are poisoned by stuffing and over-feeding than by any other form of excess, alcohol and tobacco included.

CHAPTER VIII

Hysteria

There is a danger that in our efforts to achieve necessary economies, such as those regarding food-stuffs, we may be led to make retrenchments in our expenditures that would tend to bring about panic and a condition of hard times. Already such alarmist advice has been given circulation, and the net result has been merely to bring about the hoarding of money, the withdrawal of savings deposits and the like.

Sensing this danger, Howard E. Coffin of the Council of National Defense published a warning to the country. "Waste is bad," he said, "but indiscriminate economy is worse. It is true that the President has said that this is a time to correct

our habits of wastefulness. Certainly. But the kernel of his message to the people was this paragraph: '*We need prosperity in wartime even more than we do at peace. Business depressions are always bad, but doubly so when we have a fight on our hands. It is evident to every thinking man that our industries, our farms, shipyards, mines and factories, must be made more prolific and efficient.*'"

If people who have money to spend stop buying, there will not only be panic but failures and bankruptcy. That would mean the discharge of employees, the cancellation of orders and the closing down of factories.

Those who have become alarmed at the war and who are spending fifty cents where they formerly spent a dollar, would do well to think of England. With all her expenditures in the war, there is no absurd economy in the British Isles. Money is kept moving. Panic results from a withdrawal of money from circulation, the

panic created resulting in further withdrawals, etc. The war has created better wages for English labor. The buying power, especially of the women, has been tremendously increased. There is no reason why there may not be similar results here. Even in Germany money is being made and spent freely. Business failure there has steadily decreased since 1914. For that year 7739 failures were reported; in 1915, 4594; in 1916, 1824. Compare this last figure with the year 1913, a peace year, with its 9725 failures. This would indicate that money has been kept in circulation in Germany, that stores have done a fair business. On the other hand, since the outbreak of the war the business of German pawnbrokers has fallen off decidedly.

Since the war began Germany has undertaken new public works. The new underground railroad has been built in Berlin, at Leipsic a new station was constructed and the course of a river was

changed because it was thought that otherwise it might endanger the health of the city. Since August 1, 1914, new municipal baths, libraries, theatres and parks have been built. Municipalities have spent money in order to create a demand for labor.

It is true that our government proposes to raise enormous sums by taxation and loans, but it will all be spent again by the government, or here by the Allies, and thus put back into circulation. He who can afford to spend a dollar, who is in the habit of spending a dollar, and who now blindly follows foolish advice as to indiscriminate economy and saves that dollar, will be doing the country an injury. People who can afford to spend money and who spend it are doing a patriotic service.

The Chairman of the New York Business Men's League, Joseph Yeska, says: "Surely merchants and manufacturers must have cordial support or they will

be compelled to shut up shop, and that would mean that their employees would lose their means of livelihood."

Joseph E. Hubinger, former President of the New Haven Chamber of Commerce, said: "If the people tamper with normal trade in even a few lines, it will seriously affect all lines of business."

Mrs. Julian Heath, President of the Housewives' League, remarks: "There would be a great panic and financial depression, if the women stopped buying; for that would mean a cessation of business, discharge of employees and the consequent dissatisfaction with living conditions in a nation at war."

L. D. Sale, President of the Los Angeles Chamber of Commerce, adds: "I believe that we should save the waste, but by this I do not mean that we should change our mode of living. I can see dangerous possibilities, if this country is grasped by a frenzy of hysterical economy."

These statements are typical of those

made by business men and women the country over.

We must follow the lead of the National Government. As our Council of National Defense says: "Unemployment and closed factories brought about through fitful and ill-advised campaigns for public and private economy will prove a veritable foundation of quicksand for the serious work we have at hand." Our destinies are in the hands of the men in Washington. Are we going to follow them to victory, or stampede like sheep after the alarmist and stumble to defeat? It rests with the individual American.

CHAPTER IX

Permanent Benefits to Result

Out of the war new states are coming. War's pressure has forced the abandonment of old ideas and old methods and the adoption of new. Whatever the lineup of nations when peace comes, there will hardly be a return to conditions that obtained before the war. Governments that formerly held but a loose control over the affairs and lives of their peoples have been made over into highly organized and efficient units. Lessons as to the dependence of one class upon another have been learned. The new power will doubtless be used for an increase of the welfare of humanity.

Peace will bring its problems of readjustment, but they will be comparatively easy of solution because of the machinery

that has been created and the capacity that has been developed for dealing with big problems in a national way. There will not only result a better amity between capital and labor, for instance, for war has shown them that they must be brothers, not enemies, but the knowledge that has been exchanged between nation and nation will tend to work for the uplift of all.

The process has been one of socialization of effort, integration, the organization of life for the common good of all, the freeing of the individual of burdens that properly belong to the community, leaving him time for an enjoyment of his own individuality. The extreme of individualism, the kind that allows the selfish individual who has the power to prey upon his fellows, has received a mortal blow.

Let us not be afraid that this socialization means socialism. It does not. It means rather the striking of a balance be-

tween the extreme of individualism from which we have suffered and the extreme of socialism which has been offered as a remedy for the ills of that individualism. It means only the achievement of a social unity, the working of the parts for the good of the whole and the whole for the good of the parts.

If we would know what our entrance into the war will likely mean in the way of change in our national life, we have only to look at England, whose system has been similar to our own, to see how the war is going to affect us.

After seeing her army almost crushed because it was without sufficient ammunition, the result of her individualistic system, Great Britain promptly proceeded to dispense with that system. British industry was made virtually a part of the government. At least the government became a partner in its management. Manufacturers under the old system were not obliged to make shells, no matter how

badly needed. If the price was not attractive they were not disposed to manufacture them. There was consequently much profiteering at the expense of the government. And the workman, seeing the enormous profits of his employer, struck for higher pay. Under such conditions the output of shells was not sufficient to meet the requirements of the government.

There resulted a demand for the government to assume control of industry. The Ministry of Munitions that was created proceeded to cut down excess war profits, to take over the control of all plants on munitions orders. Employees were prevented from striking at will. The government became a partner in business. The socialized state industrially was achieved. It paralleled the already existing organization of army and navy and was coördinated with their needs and requirements.

As food became a problem in the Brit-

ish Isles, the government turned its attention to agriculture and it is on the road towards a reorganization of that branch of the nation's life. The tendency of the leaders is to follow a policy that will make England independent of the outside world in that respect, if not in this war, at least when peace comes. It is thought that many of the men who have been leading the outdoor life of the trenches will not care to return to city pursuits and that there will be a big demand for arable land among the returning soldiers. It is planned to meet this demand by forcing idle and inefficiently used land into cultivation. If it were not for the scarcity of agricultural labor at present and the fact that it is not necessary to force farm production to the limit so long as sufficient food can be imported, it is certain that those in control of the affairs of the empire would place England's farm production on a basis similar to that of industry. Thorough-going control of the distribu-

tion and consumption of food-stuffs has not been effected, but there are signs of its coming.

One of the most remarkable changes brought about by the war has been the increase of the spending power of women, due to the granting in England of separation allowances and further augmentation through employment in munitions factories, etc. In Germany women employed in unskilled trades number forty-seven per cent of all operatives. Such a vast change in the status of women is bound to profoundly and permanently affect their ideas. They will not want to return to their former status and it is possible that the services that they have rendered the state in the war may bring them a measure of political freedom such as they have not had before.

If we get deep into the war, if it lasts for several years and we have to put many millions of men under arms, we, too, will have to employ women to a much

larger extent in industry than we have heretofore.

We have already made a beginning towards government control of industry. We have learned our lessons from the mistakes that England made at the start and are applying the knowledge to the situation in the beginning. That the manufacturer has been studying the situation and is prepared to do his part in co-operating with the government is shown by the ready response made to the government's appeal for help. Labor, too, has shown a like spirit.

There will doubtless be the same willing response on the part of the farmer and of the honest middleman. But that will not be sufficient. The government's assistance is needed there and needed badly. Its direction and control of the situation is absolutely necessary to insure the coördination of various supplies to meet the demand, to make waste places productive, to insure an adequate supply of labor, seed

and fertilizer, to guarantee a fair return on the investment, to prevent hoarding, speculation, dealing in futures of food, to see that reserves are created by canning, refrigeration, etc., and to prevent waste and adjust prices on a basis that will be fair to all: producer, middleman and consumer.

The government should take hold of the food situation in a way to insure a plentiful supply for home consumption as well as export, to provide against any and all contingencies, bad weather conditions, increased drains through submarine sinkings, and the possible requirement of our later being more heavily involved in the war and not being as free to devote our energies to food production as we are at present. It is not safe to count on anything short of the ultimate necessity, for we do not know what turn, or turns, the war is going to take, or just what our part is going to be in it.

But that we shall have a new America

in the end as a result of our experiences in the war would seem to go without saying. The other nations involved have already been vastly changed in their makeup. It seems logical that we, too, shall be similarly affected internally. Each of our great wars has marked a decided change in our life. The Revolution gave us birth as a nation. Our Civil War cemented the unity between the States. This war should integrate our life as a nation, teach us the value of teamwork, the oneness of our interests, develop our capacity for organization, give us a thoroughly nationalized State, eliminate the last remnants of sectional jealousies, eliminate the pulling and hauling of our individualism and work a socialization of the efforts that should be common efforts. We cannot go through such an experience without being benefited.

APPENDIX

THE following five tables, or bulletins, have been published by the division of food conservation of the Ohio Branch of the Council of National Defense, Columbus, Ohio, of which Miss Edna N. White of the Home Economics department of Ohio State University is the head:

FOODS HIGH IN PROTEIN

Food Material	Protein Per cent	Cost, April, 1917 As Purchased
Codfish (salt, boneless)	27.7	$0.25 pound
Dried beef	26.4	.60 pound
Pork (fresh ham)	24.8	.20 pound
Sardines (canned)	23.7	.10–.15 can
Mutton (loin)	23.7	.40 pound
Cottage cheese	20.9	.20 pound
Herring (smoked)	20.5	.20 pound
Ham (smoked, boiled)	20.2	.60–.70 pound
Beef liver	20.2	.15 pound
Beef (rib roll)	20.2	.25 pound
Beef (round lean)	19.5	.28–.30 pound
Salmon (canned)	19.5	.25–.30 pound
Bologna sausage	18.2	.18 pound
Ham (smoked, lean)	17.5	.30 pound (whole) .40–.45 pound (sliced)
Mutton leg	16.5	.30 pound
Halibut steak	15.3	.20 pound
Mackerel (salt)	13.9	.15–.20 each
Fowl (dressed)	13.7	.30 pound
Peas (dried, cooked)	13.4	.15 pound
Eggs (as purchased)	11.9	.34 dozen
White fish	10.6	.20 pound
Navy beans (cooked)	10.0	.17 pound
Cowpeas (green) (edible portion)	9.4	
Lima beans (cooked)	8.5	.17 pound
Oysters (solids)	6.0	.40–.75 quart
Macaroni	3.4	.16 pound
Milk (skimmed)	3.4	.10 gallon
Milk (whole)	3.3	.09 quart
Rolled oats (cooked)	0.5	.15 package

PROTEIN ALTERNATIVES

Food Material	Protein Equivalents Equal to 1 Pound of Lean Beef		Relative Cost	Calorie Value
	In Weight Pounds	In Measure		
Walnuts (in shell)	4		$1.00	3,400
Chocolate	1½	1½ cake	.60	4,173
Fowl (as purchased)	1¼	⅓–¼ av. sized	.38	952
Tuna fish (canned)	9/10	1 large can	.35	500
Eggs	1⅙	1 dozen	.34	969
Salmon (canned)	1	1 large can	.30	654
Sardines (canned)	¾	3¾ cans (3½ oz. each)	.30	757
Mackerel (salt)	1⅜		.28	1,554
Meat (lean beef)	1	4 av. servings	.28	652
Cheese (American)	¾		.24	1,342
Milk (whole) (4% fat)	5¾	2¾ quarts	.24	1,860
Macaroni (dry)	1⅜	2⅕ boxes	.23	2,348
Peanuts (in shell)	1		.20	1,870
Herring (smoked)	1		.20	731
Lima beans (dry)	1+	2⅜ cups	.18	1,701
Cottage cheese	9/10	1¾ cups	.18	463
Codfish (salt)	¾		.16	361
Bread	1½	2+small loaves	.15	1,699
Hominy (dry)	2⅓	5 cups	.14	3,763
Peas (dried)	⅝	1½ cups	.11	1,267
Corn meal	1 9/10	5½ cups	.10	3,094
Oatmeal	1⅕	7 cups	.07–.10	2,178
Milk (skimmed)	5 7/10	2⅝ quarts	.065	958
Soy beans (dry)	½	1 cup	.015	652

STARCHY FOODS

It is frequently stated that rice and other cereals are substitutes for potatoes.

From the standpoint of starch content this is true, but potatoes and similar vegetables yield bases or alkaline salts in digestion, while cereals are acid producers. Acid producers are not distinguished by sour taste, since all fruits, including lemons, are base producers.

The natural reaction of the blood is alkaline, and in order to maintain its alkalinity these salts must be furnished in abundance in the food. It is necessary that foods yielding acids in digestion be balanced by foods yielding alkaline salts. In a restricted diet there is some danger that this important fact in the selection of food may be overlooked. In order to overcome the acid produced by such foods as rice they may either be combined with milk, tomatoes, celery or other green vegetables, or green vegetables and fruits may be served at the same meal.

In general it should be remembered that fruits and green vegetables are base producers and that one may be substituted for the other. As has been said, acid flavor has no relation to final products of digestion, and fruits and vegetables yield alkaline salts.

Base Producers	Equivalents in Starch		Acid Producers	Equivalents in Starch	
	Weight Pound	Measure		Weight Pound	Measure
Potatoes[1]	1	4 medium	Rice[2]	1/5	3/8 cup
Sweet potatoes	3/4	2 medium	Hominy	1/5	1/3 cup
Navy beans	1/4	1/2 cup	Macaroni	1/5	7/8 cup
Green peas	1 1/2	2 quarts	Cornmeal	1/5	3/8 cup
Bananas	1	3	Barley	1/5	3/8 cup
Chestnuts	3/8	1 1/2 cups			

FATS MUST NOT BE WASTED

1. Serve only as much butter and salad oil at the table as will be eaten, so that left-overs will be as small as possible.

2. Use no more fat than a good recipe calls for. Too much spoils the product and may hinder digestion.

[1] Potatoes should be cooked with the skins on so as to conserve the valuable mineral salts which lie next to the skins.

[2] Unhulled or brown rice is much more valuable than polished rice, as the polishing of the kernel removes more than half the mineral salts as well as a large part of the vitamines, substances which are important to maintenance of health.

3. Add butter to vegetables just as they are served. If added during the cooking, some is lost in strength of flavor and in quantity if the cooking water is not saved.

4. Salt pork or bacon boiled with vegetables gives a pleasing flavor and adds some food value. When this boiled meat is cold it may be sliced thin, dipped in batter, browned in hot fat and served in place of some other meat.

5. The fat trimmings from a cut of meat bought in market belong to the purchaser just as much as the meat does. Such fat may be rendered and used in many ways.

6. Finely chopped suet or salt pork may be used for shortening in such mixtures as steamed puddings and spice cakes.

7. Either uncooked or cooked fats from chickens, geese or other fowls may often be used as any other fats would be. If the flavor is strong, they may be used in mixtures having strong-flavored ingredients, like molasses or spice, or they may be prepared as "savory fat."

8. Render fats by chopping them in small pieces and heating in a kettle set in another kettle containing water (the inner kettle must be so raised as to allow complete circulation of water). When completely melted, strain

through a rather thick cloth. Fats rendered in this way are not overheated and therefore keep well.

9. The shriveled tissue, which remains after rendering, is called "cracklings" or "scraps." It may be used as shortening in cornbread and other mixtures.

10. Save the drippings from roasts, sausage and broiled meats. Save the fat from pot roasts and the soup kettle. These may be used as they are for some purposes, or they may be clarified and made available for more uses.

11. Clarify fats as follows: Heat with an equal volume (or less) of water or milk (preferably sour) in a container set in hot water, for an hour or more. Stir occasionally. Strain through a fairly thick cloth. When cold the hard clean layer of fat can be easily removed.

12. Fats with rather strong flavors and odors may sometimes be satisfactorily renovated by heating with hardwood charcoal.

13. Savory fat is good for making gravies, browning stews, warming over vegetables, etc. Prepare by heating the fat with onion, salt, pepper and herbs, such as thyme, bay leaf, marjoram or summer savory.

14. In deep frying, do not have the temperature of the fat too low — too much is soaked

up by the food. Do not have it too high — its quality is impaired for future use.

15. Make soap of the fats that cannot be eaten. Lye may be readily obtained, and directions for using are given on the can.

NEED OF VITAMINES AND MINERAL SALTS

The problem of the selection of food grows more complicated as prices advance and the available food materials decrease. One of the most vital points in which the diet is likely to fall short is in the mineral-salt content and in the shortage of growth-promoting substances called vitamines.

The following suggestions are given for conserving these essential nutrients:

1. Water in which vegetables are cooked should be either served with the vegetable or used in the making of soup.

2. Potatoes should be cooked in the skins regardless of the final method of serving. This is also true of many other vegetables and fruits.

3. Unhulled or brown rice is greatly to be preferred to the polished rice from which much valuable material has been removed.

4. Fine patent flour is deficient in both mineral salts and vitamines. The milling of a higher per cent of the wheat kernel into flour would remedy this deficiency.

5. Milk should be the last thing excluded from the diet of children, because of its many advantages as a tissue-building and growth-promoting food. "A quart of milk a day for every child is a good rule."

6. Skim milk, despite its shortage of fat, is as valuable a source of mineral salts and vitamines as whole milk.

7. Ordinary "greens" are an excellent source of mineral salts.

FLETCHERISM

Horace Fletcher is 67 years young. He has the complexion of youth and the enthusiasms of a boy. In his book "Fletcherism: What It Is" he tells the interesting story of his breakdown at 40 and of how he won back his health by taking Mr. Gladstone's "tip" as to careful chewing, how he worked it out and elaborated from it his system of "head digestion." He details the story of his fight for scientific recognition, finally gained through Doctor Van Someren and Professor Leonardi of Venice, whose

reports excited the interest of Professor Sir Michael Foster and Professor F. G. Hopkins of the University of Cambridge, England. Later, through the experiments of Professor Russell H. Chittenden and Irving Fisher of Yale University, wide publicity was accorded to his theories. He has spent a fortune in spreading his good news.

Through the coöperation of General Leonard Wood, then chief-of-staff, and Surgeon-General O'Reilly of the United States Army, the War Department facilities, including the soldiers of the Hospital Corps, were used for an extensive experiment in "Fletcherism." Later Fletcher wrote a set of recommendations which were included in the Instructions of the Medical Department of the army, and which, while not a complete digest of his theories, yet contain the fundamentals of "Fletcherism." They were published under the heading:

Method of Attaining Economic Assimilation of Nutriment and Immunity from Disease, Muscular Soreness and Fatigue

1. Feed only when a distinct appetite has been earned.

2. Masticate all solid food until it is completely liquefied and excites in an *irresistible*

manner the swallowing reflex or swallowing impulse.

3. Attention to the act and appreciation of the taste are necessary, meaning, to excite the flow of gastric juice into the stomach to meet the food — as demonstrated by Pawlow.

4. Strict attention to these two particulars will fulfil the requirements of Nature relative to the preparation of the food for digestion and assimilation; and this being faithfully done, the automatic process of digestion and assimilation will proceed most profitably, and will result in discarding very little digestion-ash (faeces) to encumber the intestines, or to compel excessive draft upon the body energy for excretion.

5. The assurance of healthy economy is observed in the small amount of excreta and its peculiar inoffensive character, showing escape from putrid bacterial decomposition such as brings indol and skatol offensively into evidence.

6. When digestion and assimilation have been normally economic, the digestion-ash (faeces) may be formed into little balls ranging in size from a pea to a so-called Queen Olive, according to the food taken, and should be quite dry, having only the odour of moist clay or of a hot biscuit. This inoffensive character remains in-

definitely until the ash completely dries, or disintegrates like rotten stone or wood.

7. The weight of the digestive-ash may range (moist) from 10 grams to not more than 40–50 grams a day, according to the food; the latter estimate being based on a vegetarian diet, and may not call for excretion for several days; smallness indicating best condition. Foods differ so materially that the amount and character of the excreta cannot be accurately specified. Some foods and conditions demand two evacuations daily. Thorough and faithful Fletcherizing settles the question satisfactorily.

8. Fruits may hasten peristalsis; but not if they are treated in the mouth as sapid liquids rather than as solids, and are insalivated, sipped, tasted, into absorption in the same way wine-tasters test and take wine, and tea-tasters test tea. The latter spit out the tea after tasting, as, otherwise, it vitiates their taste, and ruins them for their discriminating profession.

9. Milk, soup, wines, beer, and all sapid liquids or semi-solids should be treated in this manner for the best assimilation and digestion as well as for the best gustatory results.

10. This would seem to entail a great deal of care and bother, and lead to a great waste of time.

11. Such, however, is not the case. To give attention in the beginning does require strict attention and persistent care to overcome life-long habits of nervous haste; but if the attack is earnest, habits of careful mouth treatment and appetite discrimination soon become fixed, and cause deliberation in taking food unconsciously to the feeder.

12. Food of a protein value of five to seven grams of nitrogen and fifteen hundred to twenty-five hundred calories of fuel value, paying strict attention to the appetite for selection and carefully treated in the mouth, has been found to be the quantity best suited to economy and efficiency of both mind and body in sedentary pursuits and ordinary business activity; and, also, such habit of economy has given practical immunity from the common diseases for a period extending over more than fifteen years, whereas the same subject was formerly subject to periodical illness. Similar economy and immunity have shown themselves consistent in the cases of many test subjects covering a period of ten years, and apply equally to both sexes, all ages, and other idiosyncratic conditions.

(Note: — The old Voit standard called for an average of three thousand calories a day,

five hundred of them, or one hundred and five grams, to be protein, and having a nitrogen value of seventeen grams, as against Fletcher's five to seven grams of nitrogen.)

13. The time necessary for satisfying complete body needs and appetite daily, when the habit of attention, appreciation and deliberation has been installed, is less than half an hour, no matter how divided as to number of rations. This necessitates industry of mastication, to be sure, and will not admit of waste of much time between mouthfuls.

14. Ten or fifteen minutes will completely satisfy a ravenous appetite if all conditions of ingestion and preparation are favourable.

15. Both quantitative and qualitative supply of saliva are important factors; but attention to these fundamental requirements of right eating soon regulates the supply of all of the digestive juices, and in connection with the care recommended above, ensures economy of nutrition and, probably, immunity from disease.